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(WITH CASES)

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(WITH CASES)

III. THE CONVERSION OF BENIGN TUMOURS
INTO CANCER.

IV. THE PRACTICAL OUTCOME OF RECENT
RESEARCHES ON CANCER.

REPRINTED PAPERS.

BY

HERBERT SNOW, M.D.LOND., ETC.

SURGEON TO THE CANCER HOSPITAL, LONDON



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J. & A. CHURCHILL

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PREFATORY NOTE

THE first of the subjoined reprints seeks to set forth with due illustration the scientific principles which should guide the modern surgeon in combating malignant disease: as contrasted with the somewhat empirical methods of former years. It further displays the unavoidable limitations of his art. The second points out a sphere wherein he may usefully stay his (operating) hand. The third calls attention to a significant point, once well recognised, now seemingly almost forgotten. While the fourth embodies in pithy form, devoid of pathological encumbrance, the practical teachings of my larger treatise on the same subject.

6, GLOUCESTER PLACE,

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THE CONDITIONS OF RADICAL CURE IN CANCER; WITH ILLUSTRATIVE CASES.*

[THE lecturer began by quoting, as an example of the ideas current even among the more educated classes upon the above topic, a phrase recently uttered at a public function by an eminent bishop of the Established Church: "Every one knows that who once has cancer always has cancer." Pointing out that the popular sense of this word as synonymous with "malignant disease" coincided with the only plausible scientific theory which accounted for all the phenomena—viz. that of autositic cell reversion—he stated that the operating surgeon of the present day really claimed the power of permanently eradicating the various lesions known as "malignant," provided only that certain easily fulfilled conditions were placed within his grasp; and that when he failed, the causes of ill-success were now clearly understood in a manner impossible to practitioners of

* Abstract of a lecture delivered at the Cancer Hospital; printed in 'Lancet,' January 12th, 1895.

the preceding generation. He showed that cancerous disease nearly always produces death by reason of the auto-infective qualities acquired by its cell elements and their mechanical transmission to distant parts ; then discussed the obstacles to surgical cure presented by the different species in the ascending scale of complexity, beginning with rodent ulcer and ending with that form most closely identified with the popular conceptions of "cancer," viz. carcinoma of the female breast. He continued as follows:]

Rodent Cancer or Rodent Ulcer is the "least cancerous of cancers," as showing in its tardiest and mildest degree the "progressive tendency to death," and as being totally devoid of auto-infective phenomena in the shape of metastatic deposits. Though sometimes loosely used, the term correctly denotes only cancer of the short hair-follicles, which is generally found in or near the lower eyelid, microscopically consisting in an aberrant reproduction of hair-follicle structure. As there are no secondary offshoots, the lesion is readily extirpated by knife or caustic within the first eighteen months or two years of inception. [The case of an officer thus operated on in 1885, and dying at the age of ninety-six in 1893 without recurrence, was here referred to.] At a later stage cure is impeded by the proximity of numerous bony structures covered by periosteum, a tissue speedily prone to malignant infiltration of any

kind. Next ranks Epithelioma, the cancer of the epithelial cells, coating, skin, or mucous membrane, clinically differentiated from Carcinoma, the cancer of secreting glands, by the important point that the metastatic particles are arrested by the adjacent lymph-glands, and only very rarely reach the blood-stream. Hence radical extirpation is effected by the removal of all the dangerous glands near simultaneously with that of the primary lesion, provided that this removal takes place before the relatively late stage of enlargement. For practical purposes three stages of growth in secondarily implicated lymph-glands must be insisted on: (1) one of insidious deposit not recognisable by any symptom; (2) one of tenderness on pressure without enlargement; (3) one of increase in bulk. Each of these occupies at least a fortnight, often more. The track of infection along lymph-glands is always definite and susceptible of accurate prediction; the fact of infection having taken place must always be assumed after the lapse of a certain time, varying with the site. To wait till glands enlarge before proceeding to their excision is usually to sacrifice the patient's life, as by that time still more distant organs of the lymphatic system will have reached the preceding stages. Thus in epithelioma of the lips the "infection path" lies through the submaxillary lymph-glands situated at the anterior edge of the salivary gland similarly

named; and on an average, secondary deposit takes place here within six months, frequently sooner. Hence it is rarely permissible to extirpate a labial cancer without synchronous dissection out of these latter, whether enlarged or not. The 38 per cent. of cures ascribed by a popular author, on the faith of German statistics, to a simple V-incision without attention to these glands is, in my opinion, vitiated by the obvious inclusion of non-malignant cases in the figures cited. On the other hand, in the tongue the infection extends with far greater rapidity, always within six weeks, often in half that time. The dangerous glands are also the submaxillary in cancer of the anterior two thirds: in cancer of the posterior regions, the cervical, just behind the angle of the lower jaw. The following cases exemplify the principles of treatment; it is not thought necessary to cite any affecting the lips or integument.

CASE 1. *Epithelioma of the tongue*.—A woman, aged sixty years, had an ulcer of four months' duration situated far back on the right edge of the tongue, and having indurated edges; also lancinating pain shooting into the ear for several weeks together, with slight enlargement and tenderness of the right submaxillary lymph-glands. Wide excision of the sore, leaving the bulk of the tongue intact, was done with the thermo-cautery, the glands being dissected out by submental incision. The operation was performed

in April, 1886, and the patient was in good health (no recurrence) in January, 1890, when last heard from.

CASE 2. *Epithelioma of the tongue*.—A man, forty-six years of age, was admitted into the Cancer Hospital, Brompton, with a typical cancerous sore one inch from the tip of the tongue on the right side, which had been present for three months. It had an excavated base, with livid, hard, everted edges, and there was darting pain. Half the tongue was excised, with the corresponding glands in the pre-enlargement stage; the microscope revealed the characteristic features of epithelioma. This was done in June, 1886; the man was not seen again till March, 1891, on which occasion he reappeared on account of an attack of eczema; he was otherwise free from disease.

CASE 3. *Epithelioma of the tongue*.—A man, sixty-five years of age, had a prominent fungating livid sore half an inch in diameter situated at the posterior margin of the left half of the tongue. It had existed two and a half months; there was neuralgic pain darting up to the ear; no gland enlargement was present, but there was slight tenderness at a spot below the left angle of the jaw. The entire organ was removed, together with the glands at the site indicated. Under the microscope the usual globes épidermiques, &c., were seen. The operation was performed in April, 1891; there has been no sign

of recurrence up to the present time (January, 1895).

CASE 4. *Epithelioma in the floor of the mouth*.—A man, forty-four years of age, had suffered from a slight ulceration of the frænum for one year caused by a fish-bone; he had felt pain for eight weeks only. The sore was very vascular, with indurated base and edges at this spot, involving the gum. On the right there was a cluster of enlarged glands the size of beans; those on the left side were tender, just beginning the enlargement stage. The tongue being threaded and held out of the way, the diseased part was freely excised by the thermo-cautery, the periosteum of the lower gum being well cauterised at the same time, and the glands on both sides dissected out. This was in October, 1892. In February, 1893, a gland the size of a horse-bean, at the edge of the mylo-hyoids in the middle line, was removed. There has been no recurrence (December, 1894).

In the rectum and uterus operative surgery can, of course, deal only with the primary lesion. Malignant disease of the former organ (Cylindroma) fortunately develops slowly, and seldom infects lymph-glands or liver for a twelvemonth from inception. Hence free excision within that period should suffice. The patient whose case has been cited,* and which was one of special difficulty, still remains in the best of

* 'Brit. Med. Journ.,' October 11th, 1890.

health; here a bleeding pulpy mass, of from one to two years' duration, projected into the gut from a part of the anterior wall so high that its uppermost limit could be touched only under anæsthesia: the age at the date of the operation (May, 1890) was seventy-five years. This illustrates a general rule that malignant tumours growing without hindrance from a free surface are less prone to infect the glands than those bound down by dense fibrous tissue, such as the familiar breast scirrhus. Cancer of the uterine cervix (usually carcinoma, less often epithelioma) must be dealt with within eight weeks, otherwise recurrence will quickly ensue by way of the lymphatic plexus in the vaginal submucosa. Supra-vaginal amputation is the treatment; as the disease to the last often advances no higher than the internal os, and as the "infection path" lies in the direction indicated, hysterectomy should be reserved for late cases, and for disease within the uterine cavity. In that of rapidly recurring carcinoma, high up in the cervical canal, diagnosed within six weeks, and extirpated by escharotics,* the patient still remains well. The date of operation was July, 1883.

With malignant developments of the connective tissues (true sarcoma) a distinct series of clinical phenomena is encountered. There is here no infection

* 'Transactions of the Medical Society of London,' vol. viii, p. 304.

of adjoining glands per the lymphatics; if any such not in contact with the tumour are found diseased, this is a sign of diffusion by the blood, and is associated with metastases also in the viscera. To eradicate, removal must therefore take place before cell particles have passed into the blood-current. Sarcomata of the long bones should be treated by amputation at the proximal articulation; in consequence of the receptive qualities of their marrow, and its intimate association with the circulation current, the operative surgery thereof, which has hitherto generally neglected this precaution, offers far less favorable results than of the short or flat bones. Within the mamma and elsewhere connective tissue growths are commonly intra-cystic or encapsuled, a fact which tends greatly to delay the advent of blood infection.

CASE 5. *Recurrent spindle-celled sarcoma of the lower jaw.*—A man, fifty-one years of age, appeared at the Cancer Hospital, Brompton, with the body of the lower jaw at the symphysis greatly thickened by a hard nodular mass projecting inwards under the tongue, and where free of the bone, about one inch in diameter, filling all the front part of the floor of the mouth. The glands on both sides were infiltrated by contiguity and blended with the preceding. A previous operation had taken place three months since. Free removal of the tumour with two thirds

of the bone was effected in November, 1886. The microscopic appearances were as above. No recurrence had taken place in July, 1893, when the patient was last seen.

CASE 6. *Spindle-sarcoma of mamma recurrent after two previous operations ; cure.*—An unmarried woman, fifty-three years of age, was admitted into the Cancer Hospital, Brompton, on October 10th, 1884. Her medical attendant had previously performed two operations on the right breast, the site of which was occupied by a large scar. Under this there was a prominent tumour as large as a child's head, together with several round bosses, two of which fluctuated, one being of stony hardness. The total duration of the disease was six years, but there was now rapid increase, a dull aching pain present daily becoming more severe. Excision was performed, the axilla being untouched. A mass of cysts was removed, containing abundant embryonic tissue microscopically identical with that of an ordinary spindle-celled sarcoma. In December, 1893, the patient was in good health, and there had been no return.

CASE 7. *Spindle-sarcoma of the breast.*—A married woman, fifty-six years of age, with ten children, was admitted into the Cancer Hospital, Brompton, on November 29th, 1886. A hard solid tumour, the size of a hen's egg, was deeply situated in the right breast; there was no glandular enlargement. The

patient stated that the duration was five weeks; she had done much hard work, lifting weights, &c. On removal the growth was microscopically shown to be a spindle-sarcoma; the axilla was untouched. No recurrence had taken place up to December, 1893.

CASE 8. *Cystic spindle-sarcoma of the breast*.—A married woman, fifty years of age, with eight children, was admitted to the Cancer Hospital, Brompton, on May 31st, 1886. The patient had a tumour as large as a walnut at the root of the right nipple; this retracted, and there was induration around it; occasional lancinating pain with sensation of heat was experienced; there were no enlarged glands. On removal it was found to be a cyst containing dark brown fluid with cholesterine crystals; part of the wall was extremely hard and nodular; under the microscope it consisted of embryonic spindle-celled tissue (sarcoma). The patient was well and without further trouble when seen on December 22nd, 1893.

Space permits no more than a passing reference to the less prevalent cancer-species. Of one, however, melanotic cancer of the skin, it is necessary to remark that, this being now shown to be a product of the Malpighian pigmented epithelium, "anticipatory" removal of the neighbouring lymph-glands is demanded exactly as in ordinary epithelioma. We have next to consider that local malady which is most answerable for the quotation cited in the open-

ing sentence, and which for generations has most strongly coloured the universal conceptions of "cancer." Carcinoma of the mamma furnishes all those obstacles to surgical eradication which we meet with in carcinomatous or analogous lesions elsewhere, with one of very grave significance peculiar to itself, viz. *insidious marrow infection*. The disease invariably begins in a minute tissue area, in a single acinus—it may be in a single cell—following always the operation of some definite exciting cause. In 11·5 per cent. this is mechanical violence; a blow often serves to indicate the precise date of inception. In the remaining 88·5 per cent. mental trouble is the most potent excitant, producing aberrations in the normal devolution of the organ, carcinoma being only one of several lesions due to interference with this process. The mamma undergoes *evolution* between the ages of fourteen and twenty-five; for the next ten years temporary *involution* ensues upon pregnancy, a process of development followed by a resting stage, which is copied in slighter degree by the phenomena of each menstrual period.* The *devolution* or stage of permanent degeneracy commences about the age of thirty-five, and is the epoch affected by carcinoma almost exclusively. Infection of the lymph-glands in the adjacent axilla by the last-named takes place

* See remarks on this point in the 'Proclivity of Women to Cancer.'

early; it is rarely delayed beyond eight weeks, occasional exceptions being presented by (1) scirrhous growths within the dense fibrous structures of the nipple, which are exceptionally chronic; (2) "atrophic" cases in withered mammæ; (3) carcinomata at the sternal border, which tend first to infect the thymus by lymphatics perforating the chest wall. When enlargement of the axillary glands takes place the normal lymph-current is unable to pursue its ordinary course, and regurgitation takes place in abnormal directions. Thus particles pass, on the one hand, into the marrow of the adjoining humerus (normally this bone is the earliest affected in the majority of instances), and, on the other hand, into the residual thymus, thus producing the condition denominated the "sternal symptom," a progressive prominence of that bone between the second costo-sternal articulations, the most unmistakable evidence of marrow deposit. Implication of the marrow takes place simultaneously with palpable enlargement of the axillary glands, which, as has been pointed out, is a relatively late stage of cell growth therein. Its occurrence must therefore be assumed in every average case of more than eight to twelve weeks' duration, those "atrophic" growths which permit life for from twenty to thirty years constituting an exception. Marrow infection has been shown to occur in at least eight out of every ten instances

of mammary scirrhus ; it necessarily leads eventually to the passage of cell-particles into the circulation, with metastases in the viscera. After excision of the mamma at a later period than eight to twelve weeks the symptoms become manifest after a variable period of years, rarely exceeding five. In order to surgically eradicate a carcinomatous breast, therefore, in an average non-atrophic case, *an operation must take place within six to twelve weeks of inception*, prior to lymph-gland enlargement, and before the possible advent of marrow infection. And not only must the tissues be very freely removed, with careful consideration of the exigencies in each individual case, but the axilla at the same time carefully cleared before the lymph-glands have had time to enlarge. The old-fashioned text-book operation by two oval incisions passing close to the palpable lesion is necessarily followed by "recurrence" in the cicatrix within a few weeks or months at the outside ; the modern methods of procedure rarely fail to secure absence of visible deposit for at least two years, even in what must be considered advanced cases of more than a twelvemonth's duration, complete success being then precluded by the previously established marrow condition. The following instances exemplify the conditions both of success and of relative failure.

CASE 9. *Breast scirrhus excised in February, 1887 ; no recurrence.*—A married woman, forty-two years of

age, with four children, had a hard "lump" above the right nipple in the breast tissue; the duration was stated to be five weeks. There were intermittent burning sensations; in the axilla tenderness was felt on pressure, but no enlargement; no marrow symptoms were present. Operation was advised on December 20th, 1886, but the patient refused until February 27th, 1887. Free removal of the breast parenchyma, together with the contents of the axilla, was performed; under the microscope the growth exhibited the ordinary phenomena of early carcinoma. The patient has had no reappearance; she was last heard of in good health and with no marrow symptoms in December, 1893.

CASE 10. *Scirrhus excised in May, 1880; no recurrence.*—A married woman fifty-six years of age, with no children, was admitted into the Cancer Hospital, Brompton, on May 21st, 1880. A hard scirrhus "kernel" as large as a walnut was present in the sternal half of the right breast. She stated the duration to be two months. A gland in the axilla was slightly enlarged. There was occasional lancinating pain; no marrow symptoms existed. Excision was performed, with careful dissection of a wide margin of the seemingly healthy tissue around the breast tumour and evacuation of the axilla. The disease on section proved to be a typical carcinoma. The patient came again on July 11th, 1892, for a

small ulcer on the gums; there had been no recurrence of cancer in any shape.

CASE 11. *Breast scirrhus excised in October, 1885; two recurrences; subsequent immunity.*—A married woman aged forty-five years, with one child, was admitted to the Cancer Hospital, Brompton, on October 18th, 1885, with nodulated tumour (“hazel-nut”) deeply situated in a gland tissue at the upper part of the right breast; a gland as large as a horse-bean in the corresponding axilla. She stated the duration to be one year. On removal the microscope revealed a typical acinar carcinoma structure, with the remarkable and probably unique addition of abundant myeloid corpuscles. In February, 1887, the patient was readmitted to hospital for the excision of a recurrent nodule at the inner end of the scar, with another gland in the axilla. Again, in October of the same year, two deposits as large as beans were dissected out of the pectoralis fibres. All these latter presented the same curious microscopic features as the primary lesion. The patient experienced no further trouble, and was last seen on May 21st, 1894, in good health and without any trace of cancer. From the previous rapidity of the reappearances and the long subsequent immunity, the permanence of the latter may reasonably be inferred.

CASE 12. *Encephaloid carcinoma of the breast; immunity for four and a half years; death from another*

cause, with no trace of disease at necropsy.—A married woman aged fifty-two years, with fifteen children, was seen on February 22nd, 1886. The left nipple was retracted. At its root there was a moveable tumour, rapidly growing, the size of a small orange, of stated duration seven months. There was slight enlargement of the axillary glands. On removal the appearances were as above. Death took place in August, 1890, and was ascribed to gall-stones. A necropsy was made (in the provinces) by two medical practitioners, who “could detect no trace of cancer.” In this and the case following, which were not personally observed until their termination, it is not, however, possible to be certain that marrow deposit was absent.

CASE 13. *Breast scirrhus excised in July, 1888; death from tubercle in 1891.*—A married woman fifty-three years of age, with six children, had to the inner side of the left breast a moveable solid tumour (“walnut”); a gland the size of a bean was in the axilla. There was continuous aching with occasional lancinating pain; she stated that its duration was ten weeks and consecutive to a blow at that period. After excision it proved to be a typical scirrhus. The patient was discharged well on August 24th, and has not been seen subsequently. According to her relatives she died on February 14th, 1891, from “rapid consumption, as shown by the doctor’s cer-

tificate ; she had no symptom whatever of the return of the cancer.”

CASE 14. *Breast carcinoma excised ; good health with no palpable cancer deposit fifteen years and a half after operation.*—A married woman, fifty-one years of age, was admitted into the Cancer Hospital, Brompton, on October 17th, 1879. At the outer aspect of the left breast there was a hard, moveable scirrhus as big as an orange, and in the axilla a gland the size of a large bean. She stated the duration to be six months, and attributed it to ill-usage by her drunken husband. After excision of the breast and axillary contents, the patient attended at intervals until January 7th, 1895. She then appeared a florid, robust countrywoman, with a marked protuberance of almost the entire sternum, and complained of aching soreness in that region, but otherwise she was perfectly free from any trace of cancerous disease.

CASE 15. *Excision of breast scirrhus ; marrow infection not apparent till five years subsequently, followed by nodular deposits.*—A married woman forty years of age, with six children, was admitted into the Cancer Hospital, Brompton, on June 13th, 1887. To the outer side of the left nipple there was a hard scirrhus kernel, the size of a walnut and freely moveable, and in the axilla a gland as large as a bean. The stated duration was three months, but the real duration, as inferred from the physical condition, was

probably from six to twelve months. No marrow symptoms were present. After the usual operation nothing wrong was observed until December 2nd, 1892; then the "sternal symptom" made its appearance, and slowly increased to the ordinary stationary point. A year later (December 4th, 1893) two nodules, each as large as a pin's head, were detected close to the sternum, rather deeply situated in the second intercostal space. On January 1st, 1894, a third minute speck was found in the middle line, with a lymph-gland as large as a hazel-nut in the right axilla. Excision of all these was performed, and the patient was discharged well. The scar left by operation on the left breast and axilla has remained throughout perfectly sound, and the general health is fairly good. (Now, January, 1895, the patient is breaking down.)

CASE 16. *Removal of advanced breast carcinoma; no recurrence in situ, but death seven years subsequently from bone lesions.*—A married woman sixty-one years of age, with six children, was admitted to hospital in July, 1886, for very hard, round scirrhus an inch and a half in diameter at the upper part of the right breast. The stated duration was three months; the real duration was evidently much longer, apparently one or two years.* The disease was of specially

* Women almost invariably understate the duration period, the margin of conscious *suppressio veri* varying from six weeks to two years.

chronic appearance; the glands were tender, but not appreciably enlarged; there were no marrow phenomena. The patient was a thin, worn woman, with a disorganised eyeball, which was simultaneously removed with the breast and axillary contents. She was in good health in March and November, 1889, but was then lost sight of until June 19th, 1893, when she reappeared with a cluster of diseased glands in the left axilla, the right remaining perfectly free and the cicatrix healthy. There was a small livid nodule under the skin covering the xiphoid cartilage. The most noteworthy physical sign was afforded by the sternum, which constituted almost a tumour, the whole bone projecting prominently forwards and being greatly thickened. In July paraplegia supervened, signifying deposit within the vertebræ, and death took place in September, 1893.*

CASE 17. *Excision of advanced breast scirrhus; marrow symptoms three years later; no palpable recurrence four years after operation.*—A woman, fifty-four years of age, had the left breast excised for a chronic scirrhus tumour, of at least eighteen months' duration, in January, 1881, with enlarged glands in the axilla. The health remained good till March 14th, 1884; then first appeared the "sternal promi-

* Photographs of the sterna in this and in the case preceding were exhibited at the Nottingham meeting of the British Medical Association in 1892.

nence," with some dyspnœa and dry cough. In February, 1885, deposit was also found in both axillæ, but the patient was still able to do her work as a domestic servant. The scar left by the breast amputation was healthy. There was no subsequent attendance.

CASE 18. *Excision of advanced mammary carcinoma; marrow infection; spontaneous fracture of sternum and tumour formation.*—A married woman, fifty-two years of age, had the left breast, &c., excised in August, 1886. A mass of encephaloid carcinoma as large as an orange occupied the whole area; its stated duration was six months, but a blow one year previously more accurately fixed the inception. The glands were necessarily implicated. No note was made of the marrow condition, the routine occurrence of marrow infection in these cases not having been discovered until 1890. The patient was in good health subsequently until November, 1887; then, after turning in bed, she felt a sudden snap at the upper part of the sternum; she again attended the hospital as an out-patient, when marked thickening of the bone was the only lesion found. On July 23rd, 1888, a livid prominent boss as large as a child's head protruded from the spot indicated. The scar was healthy; there was no sign of axillary or of visceral deposit.*

* The "sternal prominence" proceeds to actual tumour deve-

CASE 19. *Ulcerated breast scirrhus of long standing ; excision in March, 1892 ; immunity save for marrow infection to present time.*—A widow sixty-four years of age, stout, applied in August, 1888, with a cyst of twenty years' duration at the root of the left nipple. For the previous eighteen months there had been induration around this and lancinating pain (denoting carcinoma development). Operation was urged, but was declined till four years later (August, 1892) ; then the nipple was eroded (in its place being a scirrhus ulcer one inch in diameter) ; there was deep infiltration of the gland tissue at its base, together with deposit in the axilla. The "sternal prominence," as usual in stout patients, was well marked. There has been no recurrence to the present time (January, 1895) ; the woman is in good health and unconscious of any ailment.

CASE 20. *Advanced encephaloid carcinoma excised three years ; no recurrence to present date.*—A married woman forty-three years of age, very stout, with large mammæ, had in the right breast a moveable roundish mass the size of a pigeon's egg ; it had been noticed for six months. There were also slight gland enlargement and intermittent darting pain, but no

lopment in not more than 2 per cent. of the total cases. For original description of these insidious marrow lesions, and their recognition as of routine occurrence, see the 'Lancet,' March 7th and 14th, 1891 ; 'Brit. Med. Journ.,' vol. i. 1892.

marrow symptoms. Excision was performed in October, 1891, when it was found to be a soft grey carcinoma; there were deposits in several axillary glands, the largest as big as a damson; their size had previously been obscured by the abundant fat. The patient still attends every two months as out-patient, but is without visible disease and is in excellent general health.

CASE 21. *Advanced scirrhus excised two years; no recurrence to present time, but progressive marrow infection.*—A widow sixty-five years of age, with one child, when seen had in the left breast induration and retraction of the nipple, which had been noticed for eight months; probably they were of much longer duration. Slight enlargement and tenderness of the axillary glands were present; the “sternal prominence” was very marked. An operation was performed in November, 1890. To present date the scar is healthy, and there is no trace of recurrent deposit other than of that in the marrow. The patient now begins to complain of severe aching, with sensation of pressure at the spot in question on the sternum; she also complains of rheumatic pains in both scapulæ, down the left arm, &c.

Note.—Continuous *Opium* treatment commencing immediately after convalescence is strictly enjoined upon all my breast-excision cases in which any suspicion of antecedent marrow infection exists, and accounts for the prolonged immunity of some of the

preceding. It is often, however, difficult to ensure in hospital patients living at considerable distances. Opium is the only drug which markedly checks the growth of carcinomata, and its early employment even when no surgical operation takes place will commonly add years of comfortable life.

II

THE TUMOURS OF THE BREAST WHICH ARE "DISPERSIBLE" WITHOUT OPERATION*

A VERY common question by hospital patients who apply with a "lump in the breast" is "Whether this cannot be dispersed?" While it is needless to remark that such an aim is utterly impossible in the case of a cancerous growth, or that should we vainly essay for the latter merely tentative treatment, we shall only succeed in frittering away what may yet remain of the six to twelve weeks' period,† within which alone modern surgery can reasonably guarantee a radical cure, yet I should like now to point out that a margin of instances numerically considerable yet exists, wherein recourse to the operator's knife is hardly ever necessary, and in which "dispersal" can be effected with no great difficulty.

Foremost of the latter is the tumour described in

* A paper read in the Section of Surgery at the Bristol meeting of the British Medical Association, 1894.

† Vide 'Lancet,' January 12th, 1895, "The Conditions of Cure in Cancer."

my works, by way of distinguishing it from the connective-tissue mammary growths of later life, as the "fibroma of adolescence." This is found only in the evolutionary period of the mamma, *i.e.* from fourteen to twenty-five years of age. A young girl who wears a tight corset appears with the "lump" aforesaid, varying in degree from a scarcely perceptible thickening of the breast tissue to a distinct, rounded, rather nodular tumour as large as a walnut. Often several of those are present, and both breasts are affected. The pain complained of varies greatly with the emotional tendencies of the girl; and also (in no small degree) with her frequent resort to tea drinking. Commonly it exhibits an inverse ratio to the palpable magnitude of the tumour; it is always worst at the menstrual periods. Such growths are the necessary result of obstructed mammary development in early youth, and, so far as I am aware, occur only in a state of civilisation. From the huge connective-tissue growths which appear during the decline and devolution of the mammary gland, *i.e.* after the age of thirty-four, the "fibroma of adolescence" differs in not becoming associated with cyst-formation, an invariable sequel to the adeno-fibroma or cystic fibroma of middle age. The former generally yields to suitable management of hygienic and medicinal character; the latter is never cured, or even arrested, without a surgical operation.

The old rule *sublata causa, tollitur effectus*, while not absolute, yet has considerable significance in the case of an organ which, like the youthful mamma, has not yet completed its growth. The aberration of nutrition which produces these small fibrous hypertrophies of the breast stroma appears largely due to direct pressure, but something must also be ascribed to indirect pressure effects and to sympathy with the uterus, also struggling for unimpeded development. Moderate the injunctions of fashion in the matter of stays, tranquilise the nervous system, abolish tea, order some absorbent ointment, with *frequent* local friction, and the "lump" will vanish within a few weeks, seldom more than six. The application I generally prescribe is as follows:—Pulv. Plumbi Iodidi, ʒj; lanoline, ʒvj; adipis, ad ʒj. This to be well rubbed in four times daily. Occasionally I have varied this with an ointment of green mercuric iodide, twenty grains to the ounce, employed night and morning; or have substituted two drachms of the (British Pharmacopœia) red iodide ointment for the same quantity of Unguent. Plumbi Iodidi. With this fifteen grains of bromide of potassium are taken internally at bedtime to subdue the always present neurosis. Proceeding on this method, I have not found it necessary to subject any such case to operation since 1889 (*i.e.* the patient being a young girl); and then surgical measures were resorted to only in

consequence of the individual's impatience. To sear the mamma with multiple scars is a practice meriting emphatic condemnation, and even such an operation as Thomas's, designed to preclude subsequent marking, is hardly ever necessary. The following are cases in point, samples of many similar :

CASE 1. Ada N—, aged twenty-four years, single, seen July 17th, 1893. At the upper part of the left breast an induration of the parenchyma forming a flattened nodular tumour one inch in diameter. After a single week's employment of the Unguent. Plumbi Iodidi, with lanoline, there was only a slight trace of the “lump.”

CASE 2. Patty D—, aged twenty-three years, single, seen January 15th, 1894. To outer side of left nipple, flattened and indurated breast tissue, constituting a “lump” one half-inch in diameter, one year's duration; conspicuously tight stays. On the 22nd nothing abnormal could be felt.

CASE 3. Annie E—, aged twenty years, single, domestic servant. Mamma large; ill-defined hypertrophic induration of outer half of left breast, of four years' duration. Treatment from October 28th, 1889, till November 25th, then no tumour and nothing abnormal could be found.

CASE 4. Louisa Emily M—, aged twenty-three years, single, shopwoman; out-patient April 28th, 1890. At lower border of left breast a tumour the

size of a hazel-nut; noticed three years. Attendance till August 11th; then "perfectly cured." Has since married and borne two children; writes (December, 1893) to say she has had no further trouble.

CASE 5. Annie J—, aged thirty-seven years, single; out-patient June 11th, 1888. At the upper part of the left breast was a tumour of at least several years' duration, equal in size to a large walnut. Operation had been recommended by a cancer specialist. Under inunction by the lead iodide ointment thrice daily entire disappearance of the "lump" in seven weeks. Seen two years afterward; no further breast trouble.

CASE 6. Ellen O'K—, aged thirty years, married, no children; out-patient January 19th, 1891. Hard nodule the size of a pea to outer side of each breast; left largest. Intermittent attendance (from Colchester) for several weeks. On June 1st no trace of either perceptible.

CASE 7. Amelia B—, aged twenty-four years, single. Nodule the size of a large pea deep in gland tissue of left breast. Attendance from April 4th to May 21st, 1887. Use of the iodide ointment thrice daily, with entire resolution.

CASE 8. Rose N—, aged eighteen years, single. A tumour as large as a walnut, lobulated, at pectoral margin of left mamma, noticed eight months. Out-patient May 2nd, 1887; treatment until July 11th, then lost sight of. In December, 1893, states in

reply to inquiry that some enlargement persists, but that all inconvenience has ceased, and that she has never required any further treatment.

CASE 9. Emma H—, aged nineteen years, single. At the age of fourteen a tumour as large as an egg stated to have been removed from left breast; now scar three inches long at lower border. External to this, moveable tumour size of hazel-nut. Attendance from October 3rd to November 14th, 1889. Seen on January 8th, 1894, when no trace was to be felt.

CASE 10. Fanny S—, aged twenty-four years, single. Induration of parenchyma at outer part of left breast, noticed eighteen months. Treated from November 8th, 1886, to February 14th, 1887, with complete resolution.

CASE 11. Marie W—, aged twenty-eight years. At upper and outer part of left breast the tissue was hard and nodular, forming a flattened tumour one inch in diameter; noticed two months. A neurotic girl with the usual tight stays. Treated from January 2nd till March 19th, 1894, when only a faint trace of the induration remained. At first the lead iodide with two drachms of red mercuric oxide ointment; subsequently the former with fifteen grains of alcoholic extract of belladonna to the ounce.

The preceding would appear to have been examples of the true “fibroma of adolescence” occurring in young girls, with no obvious cause other than tight

stays and a neurotic habit. At a later period small indurated tumours, which cannot be regarded as due to arrested or perverted development, and which commonly own an inflammatory origin, are met with. These similarly yield to local treatment.

CASE 12. Jane H—, aged forty-four years, married, no children. Out-patient August 26th, 1876. In the left breast an irregularly nodulated, moderately hard induration of the parenchyma, noticed six years. Lancinating pain was described, but was referred also to the opposite breast, in which was another “lump” rather smaller. Although the age was so suspicious, a diagnosis of non-malignancy was founded on the duration of the case and the simultaneous affection of both mammæ. Under the inunction four times daily of Ung. Plumbi Iodidi, the condition wholly vanished in about eight weeks. On November 8th, 1887, the date of the last recorded attendance, no trace of tumour was perceptible.

CASE 13. Louisa P—, aged thirty-four years, married, three children. Ill-defined indurated “lump” in left breast following blow three months previously. Inunction four times daily of Ung. Plumbi Iodidi. Attendance from September 12th till December 19th, 1879. Gradual resolution; on latter date nothing abnormal to be felt.

CASE 14. Emma H—, aged thirty-six years, married, four children. Softish moveable “lump” at upper

part of left breast, noticed three months ; in right breast another smaller. A history of cancer in the family. By October 17th both tumours had all but entirely disappeared.

CASE 15. Eliza R—, aged thirty-eight years, widow. A hard ill-defined tumour at upper part of right breast noticed two years. Treatment as usual from September 24th, 1880, until January 7th, 1881 ; then complete resolution, leaving no trace of abnormality.

CASE 16. Fanny S—, married, one child two years of age. Blow from child seven months previously. Deep in left breast a tumour the size of a walnut, freely moveable. Treatment from December 1st, 1882, until March 2nd, 1883, then no trace perceptible.

CASE 17. Elizabeth B—, aged thirty-seven years, married, no children. In left breast hard nodule, size of large pea, noticed two years. Treated with Unguent. Hydrarg. Iodidi Viridis, night and morning, from January 25th till February 15th, 1884, with perfect resolution.

CASE 18. Emily W—, aged thirty-seven years, married, one child one year of age, not nursed. Tumour, size of walnut, noticed six months, moveable, at upper part of left breast. Treatment as usual till February 23rd, then nothing abnormal.

CASE 19. Mary D—, aged twenty-seven years, single. Out-patient November 19th, 1888. Blow two months. Marked induration at outer part of

left breast ; great pain. On November 26th nothing to be felt.

CASE 20. Emma B—, aged thirty-four years, single. Seen June 17th, 1889. In left breast a nodule size of hazel-nut, flattened, not hard, moveable, noticed four days. On June 24th no tumour discernible.

CASE 21. Martha P—, aged forty-six years, married, no children. On July 6th, 1885, a tumour the size of a small orange, moveable, elastic, at upper part of left breast. Duration one year. Attendance till July 20th, then tumour much smaller. Not seen again, but writes (December, 1893) to say she has had no more trouble.

CASE 22. Eliza B—, aged thirty-seven years, married, two children, youngest eight years of age. Small lobulated tumour at lower edge of left breast, noticed six weeks. Occasional lancinating pain for several years. Treated from September 12th till October 17th, 1892. Complete disappearance of "lump."

CASE 23. Mary L. P—, aged thirty years, single. Blow eighteen months ; pricking pain a fortnight. Tumour the size of large bean at upper part of right breast. Treated from November 6th, 1893, till December 4th, then only a trace remained.

The following is a somewhat analogous instance of irritative hyperplasia in the youthful male breast.

CASE 24. Mr. H—, aged twenty-two years, sent for

consultation in May, 1891, by Dr McElfatrick, of Mere. Irregularly lobulated induration of left breast, forming a flattened tumour one inch in diameter, noticed two to three months, and apparently caused by slight blows when jumping up to a clerk's high desk. Treated for three weeks with the lead iodide ointment, then for five days with Lin. Belladonnæ; complete resolution.

A third class of “dispersible” tumours is afforded by inflammatory conditions in, or cystic dilatation of, lactiferous ducts. And in this may be included small sebaceous cysts of the areola.

CASE 25. Mrs F—, aged forty-eight years, no children; subject to eczema of the areola. Just below right nipple prominent very hard red swelling, size of hazel-nut, noticed nine days only; no fluctuation. In great consternation, as an operation had just been advised by distinguished gynæcologist. Treatment from November 14th, 1893, till December 2nd. Liniment of iodine locally for a week, then the lead iodide ointment; complete resolution.

CASE 26. Frances P—, aged thirty-seven years, single. Out-patient December 15th, 1882. Small soft tumour, size of large pea, one inch from left nipple. After a single week's treatment only faint trace discoverable; no further attendance.

CASE 27. Jane P—, aged twenty-seven years, married, no children. Above right nipple a pea-like

nodule, evidently a dilated duct, of fifteen months' duration. Treatment from April 6th, 1891, till April 20th, then nothing abnormal found.

CASE 28. Emma W—, aged sixty-three years. Sebaceous cyst of areola, blackish in colour, size of pea, of two and a half years' duration. Seen October 28th, 1889. By November 11th entire resolution.

As already hinted, treatment such as that indicated, if adopted for a malignant tumour, will only waste the precious time available for curative eradication before secondary infection has ensued; and it is of no avail for the cystic benign growths which appear during the devolution of the female breast. A prompt and, at the same time, careful diagnosis is therefore essential. After the adolescent period (twenty-five years) even simple fibromata yield far less readily than before development is complete; and the earlier after their appearance these are dealt with, the better.

III

THE CONVERSION OF BENIGN TUMOURS INTO CANCER*

“IN truth there is no absolute line of demarcation between malignant and non-malignant growths.” This aphorism is quoted from a manual at one time in the hands of every student, and of recognised authority—Druitt’s ‘Surgeon’s Vade-Mecum.’† It has since passed into oblivion, and is no longer referred to in modern pathological or surgical writings; yet I believe the saying conveys a significant truth, and one often of considerable practical consequence. The object of this paper is again to draw attention to the principles involved in the statement, and to bring forward examples of their operation.

For present purposes, a benign tumour may be defined as any circumscribed and abnormal “lump” in the tissues, not produced by merely transient causes, and vanishing when these are removed. This will include cysts of every kind. Nearly all solid

* The ‘Practitioner,’ September, 1893.

† Ninth Edition, 1865, p. 99.

neoplasms of the class are local hypertrophies of normal structures. *Per contra*, a cancer, which commonly, but not invariably, involves tumour-formation, is a lesion consisting in the luxuriant proliferation of certain cells which have acquired *autositic* properties, and whose growth is therefore independent of the forces controlling the remainder of the organism. Its advance is continuous, though occasionally slow ; and minute fragments of the cell-protoplasm, being mechanically carried to distant parts, there engraft themselves as secondary metastases.

Some of the most familiar tumours of the benign series are of course associated with cancer phenomena only in very rare instances ; we do not expect a simple lipoma or osteoma to terminate life, or to “recur” after removal ; and a sebaceous cyst is an unsightly but very innocuous affection, until at all events it has undergone ulceration. Yet even with these common affections, occasional exceptions to the almost universal rule prevent too sweeping a generalisation. A fatty tumour of the spermatic cord removed by Mr Curling* recurred three times, and ultimately proved fatal. A man died under the care of Mr Pick† “with all the symptoms of cancer.” His abdominal cavity was found filled by a “huge mass of pure fat,” weighing 29 $\frac{3}{4}$ lbs. A case apparently showing the transition

* ‘Diseases of Testicle,’ p. 559.

† ‘Path. Trans.,’ vol. xvii.

from a simple exostosis to malignant disease, with metastases in sundry bones, is detailed by Mr Bickersteth;* and the slowly progressive ivory tumours of the orbit, reported by Spencer Watson† and others, eventually prove fatal. Intra-cystic vegetations, which are always malignant developments, have been found by Mr Butlin‡ in a sebaceous cyst; when ruptured, these cysts, ordinarily harmless, often become the seat of epithelioma.

The following appears to be an example of malignant phenomena consequent upon an ordinary exostosis; at least, we must presume the primary tumour to have been such, as no cartilage is mentioned. A woman, aged thirty, came under Mr Stanley's care with a large tumour of the leg, which had existed eighteen years; in the popliteal space were two moveable masses of recent formation. The thigh was amputated in its lower third; the exterior of the tumour was composed of soft substance, in parts "fibrous," elsewhere "encephaloid." The centre was "osteoid;" in some regions cancellous and spongy, in others yellow and ivory-like. This was continuous with a like deposit within the medullary canal of the tibia. Death took place two months after the operation, with chest symptoms. At the autopsy numerous

* 'Path. Trans.,' vol. xxvii.

† Ibid., vol. xx.

‡ Ibid., vol. xix.

isolated ivory-like nodules, mixed with fibrous and encephaloid material, were present in the remaining part of the femur here and there within its marrow. Similar new growth was present in the *femoral iliac* and *cervical* lymph glands, in the *pleuræ*, *pericardium*, and *lungs*; also around and within the *superior vena cava*.*

A second section of the benign new growths again merit ordinarily that designation, yet pass into cancer with rather more frequency than the preceding. Of such is the well-known uterine myoma; intrinsically a local hypertrophy of uterine muscle-fibre, seemingly confined to civilised races, and plausibly ascribed to aberrations in nutrition following the employment of the corset. These masses are nearly always multiple, and by their mere bulk produce various pressure effects, with chronic valetudinarianism; they are seldom of dangerous import, and rarely tend to shorten life. A minority, however, after quiescence for a long term of years as inert "lumps in the side," suddenly begin to enlarge with rapidity; produce steadily progressive emaciation, accompanied by severe pain and persistent vaginal hæmorrhage; and terminate in death. In Dr David Finlay's case† the patient was a woman of fifty-nine, who had been the subject of a hard quiescent tumour in the lower part

* Stanley, 'Diseases of the Bones,' Case 1.

† 'Path. Trans.,' vol. xxxiv.

of the abdomen for fifteen years. Rapid increase then took place, and the patient died eight days after admission into hospital, with acute peritonitis. At the autopsy a large globular mass was found attached to the uterine fundus by a pedicle one inch wide; the omentum and intestines firmly adhered to this. On the summit were two large nodules, behind which the adherent small intestine had become perforated by the new growth. The lower half of the large tumour presented the ordinary appearances of a uterine myoma, with distinct capsule. The upper half was softened, and in its middle was a ragged cavity, filled with *débris*. The disease had perforated the fundus of the bladder, appearing within the posterior wall as a fungous protuberance. The ovaries were normal; behind the uterus was an ordinary fibroid, as large as a walnut. At the base of the right lung was a metastatic nodule, as large in diameter as a crown piece; one, of the size of a pea, grew in the wall of the right ventricle, and another in the right kidney. Microscopically, two distinct appearances were found; part of the growth consisting only of small round cells or nuclei, the remainder of small spindle-shaped parenchyma. Pathologically, the disease had evidently been produced by a cancerous proliferation in the nuclei of the non-striated muscle-fibre. In my work on 'Cancers and the Cancer Process' it is described as "myo-sarcoma," being differentiated

from the sarcomata of connective tissue, and also from those congenital growths of the kidney or urogenital tract hitherto passing under the same title. For these latter I have ventured to constitute a new class, the *blastomata*, to include the rare "rhabdomyoma," and other derivatives from unobliterated foetal *residua*.

Schroeder, in 'Ziemssen's Cyclopædia,' cites eighteen cases of myo-sarcoma, under the title "sarcoma of the parenchyma of the uterus;" and while recognising that the malignancy may be primary, states that it not unfrequently proceeds from metamorphosis of a common fibro-myoma, being less restricted to later life than is carcinoma of the familiar type. Of these eighteen one was young, two were twenty to twenty-nine years of age, five thirty to thirty-nine, eight forty to forty-nine, one fifty to fifty-nine, one over sixty. Under the designation of "recurrent fibroid," Sir James Paget, in his 'Surgical Pathology,' cites several cases from Simpson's practice, in which "fibrous tumours growing from the cervix uteri into the vagina, and removed by operation, have recurred after an interval of some time." One of these reappeared three times; in all, the microscope showed the characteristic admixture of small round and small spindle-cells. Sundry others are recorded by Mr Lawson Tait, under the title "soft œdematous myoma;" though he has confounded non-malignant cases of

benign myoma, infiltrated by serum, with the cancerous lesion. In one of the former, cited in his 'Abdominal Surgery,' a livid fungus protruded from the umbilicus. Other examples, some of primary malignancy, others of malignant devolution consecutive to a benign growth, are referred to in my work above mentioned. The event is probably much more common than has hitherto been supposed, the site being remote from observation, and the possibility of such an occurrence having hardly been yet fully recognised by English pathologists. The relation of the simple to the malignant neoplasm is emphasised partly by the clinical history and the lapse of time; partly by the blending of the cancer elements aforesaid with the healthy organic muscle-fibre.

Another illustration of similar transmutation is afforded by the chronic tumours of *cartilage*; particularly by those which appear in the neighbourhood of the shoulder-joint. Like the uterine growths of muscle, these remain stationary, or increase at a very slow rate for many years; in the end displaying rapidly progressive malignant symptoms, and proving fatal with distant metastases.

Thus fig. 79 in Sir James Paget's 'Surgical Pathology' (third edition) depicts a huge cartilaginous mass growing from the upper part of the humerus. The patient was a naval surgeon, and the disease had been slowly advancing for forty years. The limb

was amputated at the shoulder-joint; but death took place in two months from disease of the chest (? metastatic). There were abundant isolated nodules in the soft parts around. A similar case of ten years' duration, in which the tumour had extended from the humerus to the clavicle and scapula, necessitating their excision, was reported to the Royal Medical and Chirurgical Society by Dr T. F. Chavasse in January, 1890. Another of eight years' progressive growth, from the humerus of a sailor, was in the Cancer Hospital at about the same time, under the care of Mr Jessett. It had commenced, as usual, in the upper epiphysis; when seen, several distinct masses grew from nearly the entire length of the bone: an operation was declined.

Instances of transition between a neoplasm which pathologists would regard as typically benign, and a highly malignant sarcoma with a shorter period of development, are not uncommon. Mr Marshall* has reported a case in which a huge mass grew from the humerus of a young woman of twenty, proving fatal in eleven months. With the exception of a few bone spicules, this was found to be cartilaginous throughout. In the liver and uterus, however, were metastases of spindle-sarcoma tissue, with apparently some cell-forms transitional from the ordinary cartilage corpuscle. I have seen in the Cancer Hospital,

* 'Path. Trans.,' vol. xviii.

under my colleague, Dr Purcell, two analogous to the preceding in outward appearance: both were in young girls. Huge masses, to the touch seemingly cartilaginous, grew from below the shoulder-joint, and were fast destroying life; the patients were, however, lost sight of before the end. For notes of several other curious cases of this description, with the pathological and microscopic appearances, see the lecture on "Cartilaginous Tumours" in Paget's 'Surgical Pathology.'

Having considered two classes of benign tumour—those which very rarely prove ultimately cancerous, and those which do this with a fair amount of frequency,—it remains to notice a third, in which a primarily innocent new growth *always* passes, if previously unremoved, into malignant disease. So far as I am aware, the only locality in which this invariable sequence takes place is the female mamma during the period of devolution. (I employ this word to signify *permanent* obsolescence; as contrasted with "involution," a *temporary* stage of repose, which may be followed by renewed functional activity.) The organ enters upon its stage of degeneration at an age varying slightly in the individual, but which may be roughly stated at thirty-eight years. Sundry phases of aberration from the normal course are witnessed, carcinoma being only one of these. Cysts are common, being generally formed by a process of mucoid

degeneration in the acinal secreting epithelium, less often by a similar process combined with obstruction in that of the lactiferous ducts. They frequently occur as secondary complications in primary carcinoma. When, however, the cyst itself is the primary lesion, it eventually becomes associated with malignant phenomena in one of three ways: either it acts seemingly as an irritant foreign body, and excites carcinoma in the immediately adjoining gland-parenchyma; or intra-cystic vegetations of carcinomatous character sprout from its walls; or, lastly, vegetations composed of fibrous tissue in a more or less embryonic condition are similarly developed within the cavity. When permitted to run their natural course, these latter run the ordinary career of spindle-celled sarcoma, with neoplasms of which species they are pathologically identical. Arrival at the cancerous stage is considerably accelerated by any of the causes of mammary carcinoma, such as a blow or severe mental trouble. It may be delayed for a brief period of years, but must be surely looked for in the end. We rarely excise a cyst which has been of appreciable size for even two or three years in the breast of an elderly woman without finding that cancer-growth in one form or another has already commenced. The carcinomatous form of intra-cystic vegetation has, on grounds which I hold to be erroneous, been designated "Duct-Cancer."

It may be noted as a clinical point not generally recognised, that this cyst-formation in the mode first mentioned, degeneration of acinal epithelium, is not merely a local but a general pathological process, pervading the entire breast, and often affecting both organs. A single cyst attains appreciable bulk, and forms the tumour for which the surgeon is consulted; or there may be one or two such. After removal the whole parenchyma is found to be more or less studded with minute vesicles; there is, in fact, a general cystic degeneration, one of the phases in devolution above referred to. An advanced form is sometimes met with in which all the solid framework has disappeared, the mamma having become converted into a single huge multilocular cyst.

Another phase of aberration is presented by the solid mammary new growths which appear in later life, and which are designated "adeno-fibroma" or "cystic-fibroma." Both titles denote one and the same variety of tumour, which often attains considerable bulk. The connective-tissue framework of the breast slowly undergoes hypertrophy to an enormous extent. Within the brawny mass thus formed are enclosed the normal gland-acini and ducts; the epithelium of these undergoes mucoid degeneration, and the lymph-channels being obstructed, very numerous cysts are developed. The latter progressively dilate through the excentric pressure of their progres-

sively increasing fluid contents; and the vesicles, at first visible only in a thin section as cribriform areolæ, eventually become large.

Each of the cysts in an adeno-fibroma is practically a cancerous lesion on a minute scale, and precluded from any rapid diffusion by the thick walls of fibrous tissue which envelop it. The epithelium continues to proliferate actively, most of the new cells undergoing conversion into mucoid fluid. In the end, however, they gain access to the environing connective tissue, and infiltrate this; speedily also producing metastatic deposit in the axillary lymph-glands. The tumour is now, to all intents and purposes, a carcinoma, destroying life with exactly the same phenomena, clinical and pathological.

Various cases in illustration of the cancer process supervening secondarily on growths in the female breast will be found in the appendices to my work already cited. Plate XIV shows a typical adeno-fibroma undergoing transition to carcinoma; the disease recurred after excision, and proved fatal. The question of cancer symptoms supervening appears under these conditions to be only one of time. In practice all tumours within the mammary parenchyma, formed therein after the age of thirty-eight years, must be regarded as either actual or potential cancerous growths, and treated accordingly.

On the other hand, it is needful to point out that

the solid fibrous-tissue mammary tumours of early life must on no account be confounded with the preceding. The "fibroma of adolescence" appears in the breasts of young girls, and is often multiple. It is rarely or never associated with cyst-formation; is a local thickening of the fibrous tissue, which disappears under suitable local applications, or under the stimulus of pregnancy; and is not known ever to pass into cancer. Hence, though often subjected to operative interference, such procedures are as a rule quite uncalled for by this common and very harmless affection.

IV

THE PRACTICAL OUTCOME OF RECENT RESEARCHES ON CANCER.*

By the kind invitation of the editors, I am enabled to lay before the busy practitioner, who has scant time for perusal of elaborate monographs, a succinct compendium of some recently published investigations in the very wide field of malignant disease. My work of necessity deals largely with questions which might (provisionally only) be styled questions of pure pathology: these are here left out of sight. But I have long felt convinced that no efficient or scientific treatment of cancer is possible without the very closest attention to pathological details; that in our modern schools Pathology is too often widely separated from her twin sisters, Surgery and Medicine, with which she should rightly walk hand in hand. The present paper embodies this view, and deals solely with points which, based on pathological considerations, yet involve lessons and results of directly practical import.

Foremost of these ranks that insidious infection

* The 'Practitioner,' August, 1894.

of the bone-marrow by mammary carcinoma as a routine occurrence, which I believe I am fully entitled to claim as an original discovery. It was indeed previously known to science that in a very small percentage (not more than 2·5 per cent.) of the total cases of breast-carcinoma there were manifested certain peculiar lesions of the osseous system, involving spontaneous fracture of long bones, and marked deformity, or even tumour-formation, in the others. But the real nature of the condition was in no wise understood. Unless an actual tumour existed, it was vaguely referred to *fragilitas ossium*, or absorption of lime-salts, a consequence of chronic wasting illness. An article by Mr Stephen Paget ('Lancet,' March 23rd, 1889) well illustrates the extent of our knowledge under this head, previously to the publication of my researches on 'The Reappearance of Cancer and its Prevention' (Churchill, 1890); 'Lancet,' March, 1891; 'British Medical Journal,' March, 1892. I therein sought to demonstrate not only that these mysterious phenomena are due to the actual deposit of cancer-cells within the marrow, but, further, that the morbid state which underlies them, the actual infection of this tissue, takes place in the great majority of breast cases—if not, indeed, eventually in all. It is, however, "insidious,"—that is to say, it does not produce tumour, fracture, or marked deformity, though still plainly recognisable by a special train of symptoms

described then for the first time. The most striking is a slowly progressive prominence of the sternum (the "sternal symptom") at the junction of the upper and middle portions of that bone. The association of this with so-called rheumatic pains in the loins and scapulæ, deeply seated, of a gnawing character, and not referred to the articulations, is the pathognomonic sign of marrow-deposit. Occasionally there is tenderness on pressure and slight apparent thickening of the humerus on the side of the disease, in its upper third. The mechanism whereby the carcinoma-cells gain access to the marrow is believed to be that of the lymphatic system. Ordinarily metastasis in the axillary lymph-glands takes place in about two months from the inception of an average *carcinoma mammæ*; thence results blockage of the lymph-channels, and diversion of the stream in abnormal directions. Regurgitation takes place along the lymphatics passing from the medulla of the adjoining humerus, the bone ordinarily first attacked; thus the cells are deposited in the marrow of that bone. In the other direction they reach, by the same means, the residual thymus, a lymphoid organ never wholly obliterated. Multiplying in the recesses of that structure, they produce infiltration of the sternum, and thus follows the peculiar sternal condition, which attains a certain degree of prominence, and then remains stationary, very rarely proceeding

to tumour-formation. The transference in these two directions may to a certain extent be interfered with by section of the lymphatics, as by an operation; in those cases known as "atrophic," which permit life for ten to thirty years, it is always very long delayed, and cannot with certainty be affirmed to occur at all. In all ordinary instances of breast-carcinoma not excised within two to three months, the phenomena are developed sooner or later, and are then eventually followed by passage of cell-particles into the general circulation, with visceral metastases. The average period at which, subsequently to operative removal of the mamma, marrow symptoms appear is four to five years.

The fact explains the many mysteries which have always attended carcinoma of the mamma, over and above every other form of malignant growth, such as the great tendency to recur after excision, and to deposit long afterwards in the opposite breast, and the supposed "constitutional" source. It is further useful in connection with the obscure bone lesions known as *mollities ossium*, *osteitis deformans*, *osteoporosis*, &c., many of which have already been identified with the presence of a malignant deposit somewhere in the marrow. It is further highly suggestive in connection with the ascertained retirement, in birds, of the *hæmatophyllum malarix* to the same structure, the blood becoming perfectly free for

the time; and it indicates that, as in cancer, the "resting-spores" of many similar obscure infective maladies may here find a more or less prolonged resting-place. In view of treatment, it is of importance as indicating the vital necessity of free operative removal within the two-months' period; and, when delay has taken place, the subsequent establishment, immediately after recovery from operation, of a permanent opium habit, whereby life may be almost indefinitely prolonged. Of several cases cursorily published as exemplars in the 'British Medical Journal' of March 10th, 1894, one was in good health, with no palpable cancer-deposit, fourteen years after the date of operation; and in several others, with very intermitting adhesion to this treatment, there was no obvious recurrence for from four to five years.

On the question of frequency, of 150 cases of mammary carcinoma seen at an average date of about ten months from inception, ninety showed well-marked symptoms of marrow infection at the first interview; twenty, the same in slighter degree; eight developed them under subsequent observation; leaving thirty in which the phenomena were absent or doubtful. On analysis, these latter fall into two categories—namely, "atrophic" cases of many years' duration; and secondly, cases too recent to betray symptoms. Thus, of these thirty, twelve were

“atrophic,” *i. e.* non-ulcerated, shrivelled-up deposits of duration from between two and three to sixteen years, five being more than nine years old when first encountered. Again, twelve of the thirty were of duration six weeks to six months, and four from six to twelve months. We may thus confidently affirm the presence of marrow infection in eight out of ten cases, or 80 per cent.

Opium was of old styled the “*Divi donum*”—the special gift of the gods to men. In respect of no diseased condition is this more true than in reference to cancer; but, unfortunately, a great mistake is made by the profession in withholding this beneficent drug until pain compels its use. Such a practice is simply barbarous. In order to secure its full measure of benefits, the medicine must be resorted to in the very earliest stages, whenever it is evident that radical extirpation by surgical methods is impossible. Thus used, no therapeutic agent we possess so nearly approaches the ideal of cure by medicinal treatment; and that deplorable vantage-ground of cancer, the female sexual organs, most markedly demonstrates the fact. Give opium continuously to a woman, for example, in the early stages of mammary carcinoma, and ulceration will be long delayed, often wholly prevented; the case passing into the shrivelled atrophic stage, compatible with many years of comfortable life. Opium

and its derivative morphine appear to me to exert a strong inhibitive effect upon the growth of cancer-parenchyma; not, it is true, wholly terminating, but always materially checking, the cell-proliferation. In my published lecture, 'The Palliative Treatment of Incurable Cancer,' is cited a case in which a large measure of apparent absorption of widely scattered skin deposits was attained; but it would be too much to hope for such success under all conditions. The good effects of opium are to a certain extent scientifically comprehensible when taken in conjunction with the indisputable frequency of supervention of mammary or uterine cancer upon an epoch of keen mental distress and anxiety.

From the surgical point of view, I have endeavoured to show that "cancer"—even the fatal breast carcinoma, the popular type of the entire class—kills not nearly so much by its growth on the primary site, as by the infective metastases thence emitted. Therefore it follows that a permanent cure can always be effected in the organs with which the operating surgeon is mainly concerned; provided that not only the part first diseased, but also the tissues ordinarily infected secondarily, be timeously removed before the infection has extended still further. Thus excision of a scirrhus breast *per se* is an almost futile proceeding, doing a little to prolong life and obviate suffering, but that is all. In order to cure, the

axillary lymph-glands, infected as a rule within eight weeks of inception, must also be thoroughly cleared away; then, *provided always the operation take place within the above marginal period*, we may well hope for lasting immunity. The same rule holds good with cancer of lips, tongue, *et hoc genus omne*. Further, the golden maxim of modern cancer surgery is, or should be, to excise the dangerous lymph-glands in the always definite "infection-path" *before the relatively late stage of enlargement*. Increase in bulk does not take place until after several weeks of insidious cell-growth in the meshes of a lymph-gland, during which period more remote glands are receiving metastases, and cell-particles may also pass into the current of the general circulation.

Here comes in the importance of an accurate acquaintance with pathology; for malignant tumours which are developed from the connective tissues do not infect the adjacent chains of lymph-glands, and if the latter be plainly diseased an operation is all but useless. If with a sarcoma of the mamma, for example, be found enlarged axillary glands, this denotes infection of the blood-current, and implies that visceral deposits will also be present. Hence not only will excision of the glands be futile, but it will generally be unwise to touch surgically the primary new growth. Or, again, should the case be recent and the axilla healthy, no advantage will be

gained by exposing the patient to the somewhat greater risk of an axillary dissection—a measure imperative, with a few exceptional instances, in early carcinoma.

In the same connection may be, for practical purposes, regarded my differentiation of the two kinds of melanotic cancer, hitherto almost universally blended under the common title “melanotic sarcoma.” Melanotic disease of the skin arises, with rare exceptions, in the pigmented cells of the Malpighian rete.* It is therefore a variety of epithelial cancer, and infects the neighbouring lymph-glands exactly as does the common epithelioma. Arising, as it very frequently does, in a small pigmented wart of the extremities, the corollary follows that extirpation of the primary lesion is of little use; the main point is evacuation of the axillary contents in the one case, of the inguinal lymph-glands in the other; otherwise the metastases herein rapidly infect more distant glands, and finally the blood. *Per contra*, melanotic cancer of the eyeball arises in pigmented connective-tissue corpuscles, and is a true sarcoma, not attacking the lymph-glands unless it affects also the viscera simultaneously. This generalisation, at least so far as regards the integumentary lesion, has been since independently corroborated by Unna, of Hamburg.†

* ‘Lancet,’ October 15th, 1892.

† ‘Nævi und Nævi-Carcinoma,’ ‘Berlin. klin. Wochenschrift,’ i, 1893.

Bearing upon this point of differentiating sarcoma from carcinoma and from epithelioma (terms I am compelled on clinical grounds to dissociate) is the maxim for microscopical guidance,* that, when a thin section of any doubtful tumour is so examined, the latter must on no account be regarded as a sarcoma *unless it consist wholly or in great part of spindle-cells arranged in bands*. There is no such neoplasm as a "round-celled sarcoma;" the growths so regarded being either carcinomatous, or derived from the lymph-glands with other adenoid tissues;† or, lastly, referable to those obscure malignant developments of unobliterated vestigial remnants which in the work last cited I have ventured to erect into a separate class under the title "Blastomata" (βλαστός, germ). In view of the measures of "anticipatory lymph-gland removal" above advocated, the necessity for precise recognition of the true pathological position of any suspicious growth is apparent.

I have endeavoured, on clinical grounds, to lay down a strongly marked line of demarcation between the tumour-formations of the female mamma at its different stages of development, and this carries with it significant indications for treatment. In this organ

* 'Cancers and the Cancer-Process,' p. 117.

† The marrow is one of the most important of these, and its primary cancerous lesions, so far as is now known, consist of small round cells (lympho-carcinoma).

three periods demand recognition: the period of evolution, lasting from the age of fourteen to twenty-five; a middle, of functional activity; thirdly, a final, of devolution or obsolescence, from thirty-four onwards. The age of functional prime is, broadly speaking, devoid of tendency to tumour-formation, and so is here disregarded. The evolution stage is characterised by the "Fibroma of Adolescence," the well-known adenoid of young girls, a harmless local hypertrophy, commonly multiple, not associated with cysts, not running into cancer, yielding readily to treatment, and not demanding surgical interference in any shape. On the other hand, the devolution period displays the "Cystic Fibroma," sometimes called "Adeno-fibroma," a lesion bearing some resemblance to the preceding, but always associated with cysts, not influenced by treatment, invariably merging in the end into some form of malignant disease, and so demanding early extirpation. This final decadence of the organ, it is hardly necessary to remark, is also the time whereat carcinoma must almost exclusively be looked for, and when, therefore, an *a priori* anticipation of its manifestation under the influence of due exciting causes should tinge our diagnosis of every breast-tumour. Carcinoma is but one of several phases of aberration in the permanent degeneration of the female breast, all brought about by mechanical or emotional inter-

ference with natural processes, and all finally passing into either carcinoma or sarcoma. A "lump in the breast," previously to twenty-five years, may often be "severely let alone;" one after thirty-five can be disregarded only by the surgeon who is reckless to the verge of criminality.

It has been already indicated that for the man who surgically aims at curing cancer—and in these days heavy blame should surely rest on him who does not either approach it with that admitted object, or else does not plainly discern the sources of his failure—prompt recognition is everything, or very nearly so. So in my published writings I have strenuously laboured to enforce the vital consequence of *a priori* considerations. We have to remember the usually obvious exciting causes of each local variety; and we have also, from the environment, to consider who is or is not a likely subject for malignant disease. We shall thus, I think, seldom fail to arrive at that judicial diagnosis which, in the earliest stages of disease, must ever be based upon a careful comparison of probabilities, and which, moreover, should never lose sight of the fundamental maxim, *No cancer without a definite cause.*

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